Web-Based Training

Bringing Prevention Into The 21st Century

The Evolution of WBT

Distance Education

Mid 1800s	1920s	1940s	1980s	1980s-90s

←--→

correspondence education	radio courses	educational television	teleconferencing	satellite television

Computer-conveyed Education

World War II	1950s	1960s	1990s

←--→

audiovisual education	drill-and-practice sessions	PLATO	personal computers with multimedia
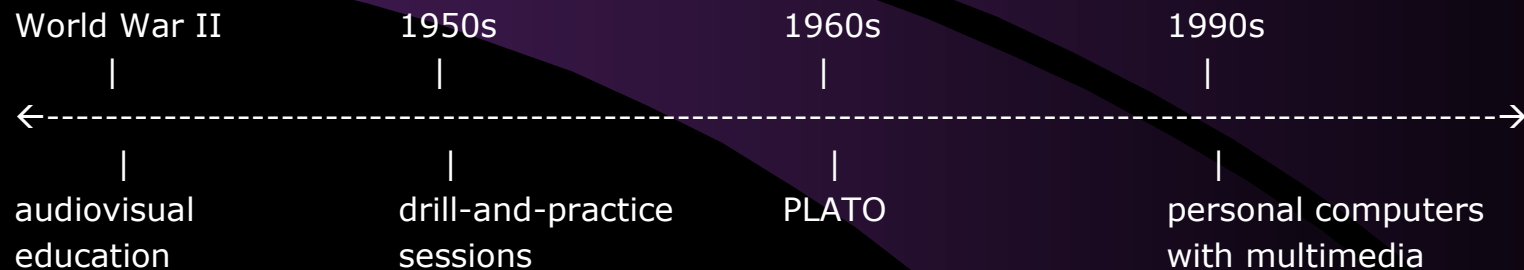
How E-Learning Differs From Traditional Training

- an e-learning course is delivered on a computer giving learners the flexibility to take the course from anywhere they can get an Internet connection.

- an e-learning application is delivered on demand, rather than on a specific schedule, so learners can take the course at their own pace.

- learners create their own learning experiences, with the help of the online materials you have created. Learners select which parts of the material to study and in which order.

Considerations

Taking Classroom Training
to the Web

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General Advantages of WBT

- WBT is perfect for the just-in-time training demanded today. A survey conducted by the Gallup Organization of 1012 U.S. workers in May and June of 1998 found that 99% of workers feel they need additional training. The same survey found that workers preferred informal on-the-job training and self-paced training to formal classroom training.

- "Creating an online learning system can allow an organization to deliver globally accessible learning programs in weeks, not months as would be the case with either text or CD based materials." -Merrill Lunch

- Maintaining courseware is also easier since content can be easily modified once it is placed online.

General Advantages of WBT

- Using audio with video can promote engagement of multiple brain channels, resulting in increased retention.

- Animation and graphics, combined with programmed logic allows software to "adapt" to user input, providing a richer learning environment (Brogan, 1999).

- Research shows that students learn more when they can control the course of their learning. Software can be architected with an understanding that individuals differ in their learning preferences and paces. The instructional software can provide a combination of audio, video and animation to appeal to different learners' styles. Students may repeat instructional sections without feeling embarrassed.

General Advantages of WBT

- In the assessment area, technology can be used to:[14]
  - Assess prior knowledge
  - Create a prescriptive learning plan
  - Reinforce learning
  - Provide immediate feedback
  - Measure success

Common Pitfalls

- Replicating classroom training
- Doing too much too soon
- Blind faith in technology or vendors

Advantages for the Producer

- Lower delivery costs once developed. Overall, WBT is 40-60% less expensive than traditional training.
- Faster training delivery across a large audience.
- Fewer facilities required for delivery.
- No travel required for instructors or learners.
- E-learning captures knowledge that only existed in the brain of the instructor and makes it easier to refine and reuse.
- Course content can be dynamic.
- Instructors can check learners; facts and references quickly.
- Access to Web-based resources.
- Centralized storage and maintenance.
- Collaboration mechanisms.

Disadvantages for the Producer

- Costs more to develop- possibly 4 to 10 times as much as classroom instruction.

- Requires new skills.

- E-learning must clearly demonstrate a strong return on investment for the learner until the field has fully demonstrated its value.

- Requires producers to design coursework within technology restrictions based on needs of learners.

- Conversions of traditional trainings often take longer than expected

- Instructional design and production must be outstanding.

- Some professional may feel threatened by WBT as they may have to adopt new roles and responsibilities to support it.

Advantages for the Learner

- Learning anywhere, anytime.
- Less travel/time off the job.
- Self-paced, self-directed learning- training adapts to the learner's style.
- Receive immediate feedback.
- Increases reflection time before responding.
- WBT emphasizes learning, not just the number of persons attending a training.

- Helps learners identify knowledge resources for future use.
- Increased accessibility, when properly designed, for learners with vision, hearing, and learning disabilities or those who learn in a second language.
- Authentic practice can be experienced through simulations.
- Access to real-world data.

Disadvantages for the Learner

- Intimidating technology.
- Costs of technology- memory, processor speeds, plug-ins, Internet connection speeds.
- More self-discipline and effort is required.
- Many learners prefer a traditional format.
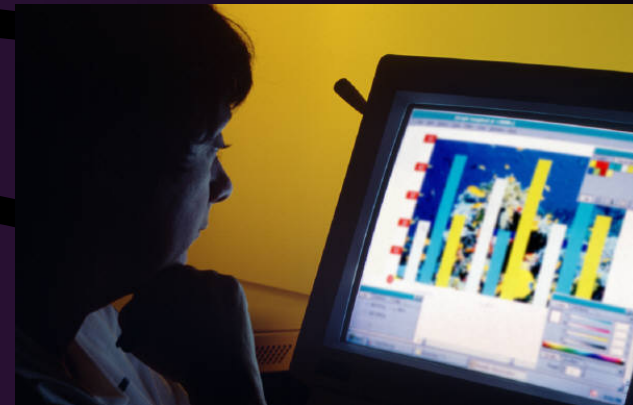
Who Are The Learners?

Adults Using the Internet for Learning

- Computer use is also relatively high – about 70 percent in 2001- among people in their prime workforce years (generally people in their 20s to their 50s).

- Males and females have had approximately equal rates of computer use since 1997.

- Eighty percent of all Internet users have done an Internet search to find the answer to a specific question that they have, and 16% of adult Internet users go online on a typical day to get an answer to a question.

Adults Using the Internet for Learning

- In all, about 60 million Americans have used the Internet to seek health and medical information.
- 58% of African-Americans with Internet access have sought health information.
- 63% of those 50-64 years old with Internet access used the Web for health information.
- 80% of health seekers say it is important to them that they can get this information anonymously, without having to talk to anyone; 16% of health seekers said they has used the Web to get information about a sensitive health topic that is difficult to talk about.

Adults Using the Internet for Learning

- Fifty-two million American Adults, or 55% of those with Internet access, have used the Web to get health or medical information.
  - 48% of these health seekers say the advice they found on the Web has improved the way they take care of themselves;
  - 55% say access to the Internet has improved the way they get medical and health information.
  - 93% of health seekers say it is important that they can get health information when it is convenient for them.
  - 43% of health seekers were looking for information for themselves during that most recent visit. 47% of those who sought health information for themselves during their last online search say the material affected their decisions about treatments and care.
  - 54% of health seekers say they were searching for information on behalf of someone else, including their children, their parents, and other relatives, during the most recent time they went online for health information. 36% of those who sought health information for someone else during their last online search say the material affected their decisions on behalf of that loved one.

Adults Using the Internet for Learning

Health Seekers:
Internet users who have gone online for health or medical information

- Online parents   59%
- All Internet Users   55%
- Online non-parents   52%

Adults Using the Internet for Learning

Work-related research: Internet veterans (those with more than three years experience) are very comfortable doing work-related research online. Well-to-do internet users have shown sharp growth in this activity.

- Fully 63% of them have done work-related research online.
- 37% those with less than a high school education have done work-related research online suggesting that more and more types of jobs, including low-skilled posts, are tied in some way to the Internet.

Adults Using the Internet for Learning

Other education-related findings in the survey work of the Pew Internet project:

- 5% of adult Internet users have taken a class online for college credit.

- 53% of adult Internet users have gone online to do research for school or job training. On any given day 8% of adult Internet users are online doing research for school or job training.

- 52% of adult Internet users have done job-related research online. On a typical day, 16% of Internet users are online doing job-related research. About half of Internet users (more than 50 million people) have access to the Internet at work.

Adults Using the Internet for Learning

Adults want:

- Practical information focusing on local community;
- Information at a basic literacy level;
- Easier searching and usability;
- Encouragement;
- Involvement;
- Content for non-English speakers; and
- Cultural information.

Youth/Young Adults Using the Internet for Learning

Among all 15-24 year-olds:

- Nine out of ten (90%) have gone online.

- Three out of four (74%) have Internet access from their home.

- One in four (24%) has gotten "a lot" of health information from the Internet.

Youth/Young Adults Using the Internet for Learning

Among the 90% of all 15-24 year-olds who have ever gone online:

- Three out of four (75%) have used the Internet as least once to find health information. This is more than the proportion who have ever gone online to check sports scores (46%), buy something (50%), or participate in a chat room (67%), and about the same proportion that have ever played games (72%) or downloaded music (72%) online.

- One in four have researched depression or mental illness (23%) and problems with drugs or alcohol (23%).

- Half (49%) go online at least once a day.

- Three out of four (78%) go online at least a few times a week.

Youth/Young Adults Using the Internet for Learning

Among the 75% of all 15-24 year-olds who have used the Internet to find health information:

- Four out of ten (39%) look up health information online at least once a month.
- Four out of ten (39%) say they have changed their personal behavior because of health information they got online.
- Seven out of ten (69%) have talked with friends about health information the saw online.
- Half (53%) all younger online health seekers (15-17 year-olds) have talked with a parent or other adult about health information they got online.

Youth/Young Adults Using the Internet for Learning

- The vast majority of young people (73%) say that knowing who produced the information is very important to them when they're looking for health information online .[4]

- Confidentiality is one of the most important concerns for young people seeking health information. Among all 15-24 year-olds, more than eight out of ten (82%) say having their confidentiality protected is very important when they are looking for health information.[4]

- Most online youth feel secure about the privacy they have when looking up information online.[4]

- Having to use a computer in a common area doesn't pose a concern for the majority of young people online today: 61% *disagree* with the statement that "looking up information online doesn't feel private because I usually have to use a computer where people can see what I'm doing." [4]

- The vast majority of online youth (76%) agree that "looking up information online is good because I can look things up without anybody knowing about it."[4]

Youth/Young Adults Using the Internet for Learning

Children and youth want:

- Participation and self-expression;
- High-impact packaging with interactivity;
- Multimedia;
- Youth-friendly tutorials;
- Easier searching and usability;
- Encouragement; and
- Involvement

Cost Considerations

- Per-course Cost Considerations
- Total Per-course Costs
- Total Per-class Costs
- Total Per-learner Costs
- Return on Investment

Per-Course Cost Considerations

- Development Time Rate- refers to the numbers of person-hours of development required for each finished hour of instruction.

- Estimated Hours Needed to Develop One Hour of Web-Based Training [16]

Production Quality	Soft Skills	Technical Skills
-Basic linear presentation, limited interaction, and simple media	90	100
-Moderate levels of interaction, rich media, and moderate nonlinear branching	170	190
-Highly interactive program using rich media and complex nonlinear branching	490	480

- Development Cost rate- refers to the cost of each person-hour of development work.

Total Per-Course Costs

To calculate the total per-course costs, multiply the length of the course in hours by the development time rate and by the development cost rate.

Per-course costs	Classroom	WBT	
Course length	8	8	hours
Development time rate	50	200	hours development/ course hour
Development cost rate	$35	$90	USD/hour development
Total	$14,000	$144,000	USD

Total Per-Class Costs

To calculate the per-class costs we just multiply the per-class cost by the number of classes.

Per-class costs	Classroom	WBT	
Instructor salary	$280	$280	USD
Instructor travel	$1,500	-	USD
Facilities	$250	$50	USD
Subtotal (per class)	$2,030	$330	USD
Class size	20	20	learners
Number of learners	200	200	learners
Number of classes	10	10	classes
Total class costs	$20,300	$3,300	USD

Total Per-Learner Costs

To calculate the per-learner costs, add up the learner's travel costs and salary and the instructor's salary costs and then multiply the total times the number of learners.

Per-learner Costs	Classroom	WBT	
Learner's travel costs	$1,500	-	USD
Learner's salary	$280	$140	USD
Instructor's salary	$14	$14	USD
Subtotal (per learner)	$1,794	$154	USD
Number of learners	200	200	learners
Total learner costs	$358,800	$30,800	USD

Total Costs			
Per-course costs	$14,000	$144,000	USD
Per-class costs	$20,300	$3,300	USD
Per-learner costs	$358,800	$30,800	USD
Total costs	$393,100	$178,100	USD

In our example, WBT saves $215,000 over classroom training.

Return on Investment

Many organizations evaluate proposed projects based on their return on investment.

$$ROI = \frac{\text{(Total costs for classroom training) - (Total costs for WBT)}}{\text{(Development costs for WBT)) - (Development costs for classroom training)}}$$

$$= \frac{\$393,100 - \$178,100}{\$144,000 - \$14,000}$$

$$= \frac{\$215,000}{\$130,000}$$

$$= 165\%$$

Technologies Involved

Multimedia Development Tools

- Animation Software
- Audio Software
- Graphic/image manipulation software
- HTML editors and site design software
- Video software
- Shareware
- Simulation software
- Adaptive testing assessment authoring software
- Virtual lab software
- Course authoring software

Data-tracking Methods

- File-based tracking- effective for tracking a small amount of data, quick and inexpensive method for storing data, text files

- E-mail data-tracking- an e-mail message transmits a few basic items and their performance

- Database data-tracking- large amounts of data, extensive reporting requirements, built-in security, data can be retrieved directly by other systems, may require middleware to pass data between the source and server (ASP, ColdFusion, CGI)

- Learning Management Systems (LMS)- an off-the-shelf product that manages the deployment, management, and tracking of e-learning courses. It utilizes a database for storing information.

E-Learning Delivery Platforms

Software applications in this category are primarily focused on the design, delivery, and tracking of Web-based training courses. There are four kinds of delivery platforms.

- Web/computer-based Training
- Web/Electronic Performance Support Systems
- Web/Virtual Asynchronous
- Web/Virtual Synchronous Classrooms

E-Learning Delivery Platforms

Web/computer-based Training- Individual learning that features drill-and-practice, simulations, reading, questioning, and answering.

- QuelSys: SocratEase (http://www.socratease.com)
- Convene.com IZIO (http://www.convene.com)
- Serf (http://www.serfsoft.com)

E-Learning Delivery Platforms

Web/Electronic Performance Support Systems- Just-in-time training focused on problem solving.

- XHLP (http://www.xhlp.com)
- DomainKnowledge: ProCarta (http://www.domainknowledge.com)
- Information Mapping: Formatting Solutions (TM) (http://www.infomap.com)

E-Learning Delivery Platforms

Web/Virtual Asynchronous Classrooms- Non-real-time group learning using experimental tasks, discussions, and team projects

- IBM/Lotus: Learning Space (http://www.lotus.com)
- Blackboard (http://www.blackboard.com)
- WebCT (http://www.webct.com)

E-Learning Delivery Platforms

Web/Virtual Synchronous Classrooms- Real-time collaboration using group learning techniques such as discussions, problem solving, and reflection.

- Centra (http://www.centra.com)
- InterWise (http://www.interwise.com)
- Placeware (http://www.placeware.com)

Learning Management Systems (LMS)

The objective of these products is to manage learners, keeping track of their progess and performance. These products embrace just about any use of Web technology to plan, organize, implement, and control aspects of the learning process.

- CBM Technologies: TEDS (http://www.teds.com)
- Docent Enterprise (http://www.docent.com)
- IBM/Lotus: Mindspan (http://www.ibm.com/mindspan/)
- Saba Juman Capital Development and Management Systems (http://www.saba.com)

Learning Content Management Systems (LCMS)

These systems label, track, and manage learning objects and then organize them for delivery in infinite combinations. These systems are purchased in addition to e-learning delivery platforms and as complements to a learning management system. Most LCMS have built-in LMS functionality.

- Avaltus (http://www.paybacktraining.com)
- Global Knowledge (http://kp.globalknowledge.com)
- Knowledge Mechanics (http://www.knowledgemechanics.com)
- LeadingWay Knowledge Systems (http://www.leadingway.com)
- WBT Systems (http://www.wbtsystems.com)

Getting Started

I. Assembling Your Design Team

- Project Manager
- Courseware Developer/Webmaster
- Instructional Designer/Subject-Matter Expert/Instructors
- Technology Integration Specialist/System Manager/Programmer
- Visual Designer/Graphic Artist/Webmaster
- Multimedia Developer/Webmaster

2. Setting Goals

Review the original goals for the classroom training and compare them against the results experienced.

- Are there goals you have been unable to achieve in the classroom?
- Can online technologies allow you to achieve those goals?
- Can e-learning help you reach other learners?
- Will limitations with the online medium, restrict what your course can accomplish?

3. Reanalyzing Learners

- Why are they learning?
- How much do they want to learn?
- What kind of knowledge do they seek?
- Where are they when they learn?
- When will they take the course?
- How can they best learn? - Language skills, typing skills, physical abilities, motivation
- What technology can learners use?
- What is the learners' current level of knowledge?
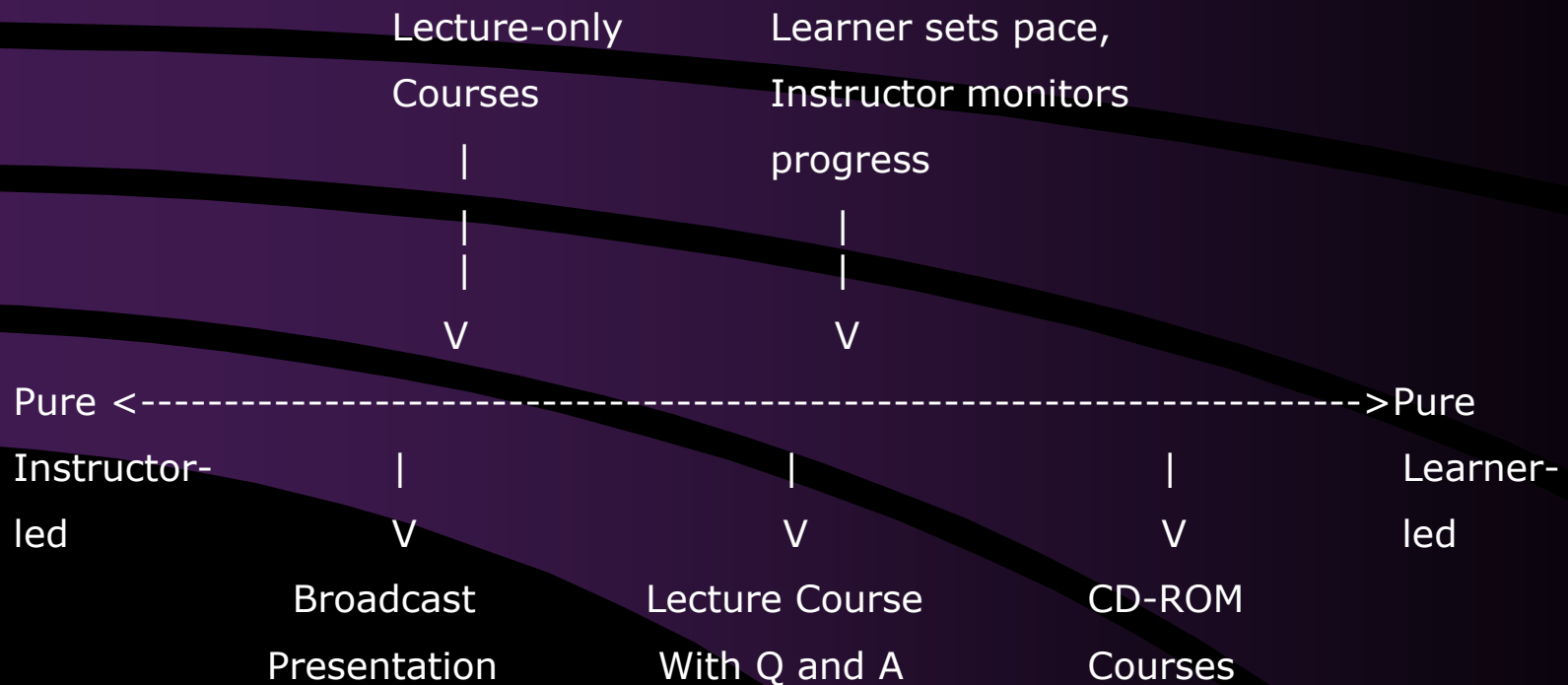
4. Specifying the Course

Describe the lessons, sections, topics, activities, practices, and other aspects of the course so that developers can create them later.

Course Objective --> High-level(lesson) Goals --> Low-level(learning object) Goals

Learning objects are experiences where you combine the goal and learning experience into a self-contained module.

Introduction --> Motivation --> Presentation --> Practice --> Summary

Instructor -Led or Learner-Led?

```
           Lecture-only          Learner sets pace,
           Courses               Instructor monitors
                                 progress
               |                     |
               |                     |
               |                     |
               V                     V

Pure <----------------------------------------------------------->Pure
Instructor-        |                 |                 |           Learner-
led                V                 V                 V           led
           Broadcast          Lecture Course     CD-ROM
           Presentation       With Q and A       Courses
```

Synchronous or Asynchronous?

- **Synchronous WBT** means that learners involved in an activity must perform their part at the same time.

- **Asynchronous WBT** means that learners can experience activities whenever they want.

Creating Motivation

- Set clear expectations
- Clearly state the benefits of learning
- Invoke curiosity
- Challenge learners
- Offer incentives for completion

Types of Learning Experiences Possible

- Examining good and bad examples
- Performing a procedure or playing a role
- Planning and conducting experiments
- Listening to someone tell a story
- Answering questions on a subject
- Searching for relevant resources

- Participating in a discussion
- Gathering and analyzing data
- Repeatedly recalling and applying knowledge
- Creating work and having it critiqued by others
- Critiquing the work of others
- Watching a video or animation sequence
- Comparing, contrasting, and summarizing information

Traditional Learning Methods and Their WBT Equivalents

Traditional Learning Methods	WBT Equivalents
Listening	Webcasts, online conferences, audioconferencing, videoconferencing, presentation sequences
Seeking Advice	Mentoring, e-mail roster or instructor and learners, discussion groups, guest speakers in webcasts
Reading	Presentation sequences, related resource pages, course reference pages, virtual libraries
Watching	Webcasts, presentation sequences, event-playback pages, whiteboard, screen-sharing sessions
Examining Exemplars	Virtual museums, online conferences, virtual field trips, guided tours, featured examples

Traditional Learning Methods and Their WBT Equivalents

Traditional Learning Methods	WBT Equivalents
Critiques by Others	Discussion groups, mentoring, group critique activities
Model Behaviors	Mentoring, webcasts, case-study activities, simulators, learning games, tests
Exploring	Guided tours, simulators, learning games, tests, virtual laboratories, brainstorming activities
Discussions	Discussion groups, chat sessions, mentoring, online conferences, e-mail roster
Practice	Simulators, learning games, tests, drill-and-practice activities, procedure pages
Memorizing	Drill-and-practice activities, presentation sequences
Conducting Research	Guided research, guided analysis, case studies, exploratory tutorials, scavenger hunts

Creating a Design Document

- Introduction
- Instructional Strategy
- Navigation Map/Treatment & Web-based Training outline
- Resources
- Program Management
- Budget
- Deliverables

Introduction

- Background
- Opportunity Statement
- Audience
- Goals/Objectives

Instructional Strategy

- Presentation of information
- Learner participation
- Evaluation strategy

Navigation Map/Treatment & Web-based Training Outline

- High-level graphic map
- Treatment statement
- Lesson outline for each unit:
  - Title
  - Goals/Objectives
  - Length
  - Content
  - Learning Activities
  - Assessment

Resources

- Design Resources
- Development Resources
- Delivery Resources
- Maintenance Resources

Program Management

- Timeline
- Roles and Responsibilities
- Risks and Dependencies

Budget

- Skilled Labor
- Production Value
- E-learning Software
- Hardware
- Stock Images and Media

Deliverables

- Disks
- CD-ROMs
- Files
- Documents
- Digitized Video Clips
- Photographs
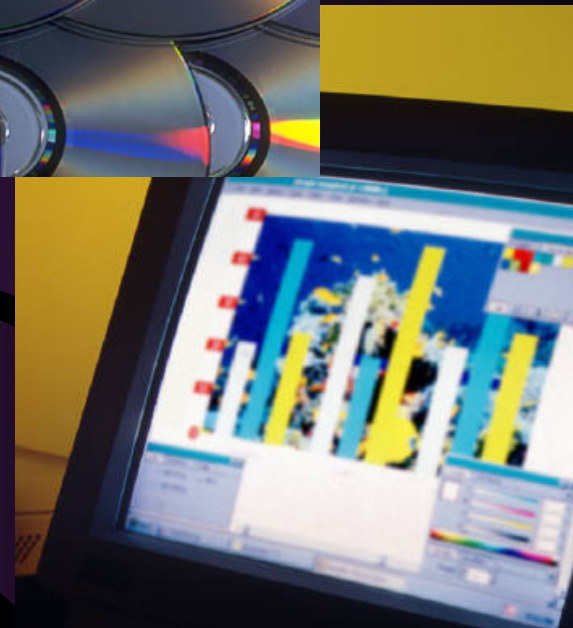
5. Converting the Materials

- Video Recordings- convert lectures to videotape, digitize and compress the video, and post the video clip onto a streaming-media server.

- Audio- use when seeing the instructor speak is not an essential part of the learning experience. Audio is best recorded in a professional sound studio, but can be recorded in the office using your computer and a microphone.

- Text Transcripts- text downloads quickly and even learners without sound cards can read text.

5. Converting the Materials

- Slide Presentations
  - save complete PowerPoint presentations as HTML
  - save the slide text as a Rich Text Format (RTF)
  - use a screen-capture program to snap a picture of each slide for use in recreating the presentation
  - copy and paste each graphics object from PowerPoint into the animation and recreate the slides
- Reading Assignments and Handouts
  - HTML
  - Adobe Acrobat PDF

5. Converting the Materials

- Test and Quizzes- one way to provide practice is to include simple quizzes, tests, or exams. These can be scored and recorded or not recorded.

- Hands-on Practice- you can create practice sessions of things like HTML coding with feedback and conceptual tasks through drag-and-drop games.

- Asking Questions- getting learners answers to the questions can be accomplished through a combinations of menus, course index, FAQ page, e-mail, discussion forums, and chat.

- Online Extras- you can take your learners in visits to virtual museums, on virtual field trips, provide calculators and glossaries, and provide job aids that guide them through specific tasks.

6. Evaluating a Prototype

- Recruit learners
- Prepare the learners
- Create comfortable environment
- Monitor current performance
- Conduct the training
- Measure the results

7. Redesign Based on Feedback

- Did learners learn what they were intended to learn?
- Were presentations confusing?
- Did learners lose motivation?
- Did technical glitches interfere with learning?
- Did learners require more time than anticipated to complete the course?

Examples

Monitoring the Technical Side of E-Learning Links

- Brandon-Hall.com Dispatch (http://www.brandonhall.com/public/dispatch/index.htm)
- Computer World (http://www.computerworld.com)
- TechRepublic (http://www.techrepublic.com)
- Learning Circuits (http://www.learningcircuits.com/)
- Training Supersite (http://www.trainingsupersite.com/)
- Smarterorg (http://www.smarterorg.com/elearning.html)

Programs That Teach Attitudinal Skills

- Negotiating Your Success: YouAcheive.com (http://www.youachieve.com/testdrive/default.asp)

- Developing Fundamental Critical Thinking Skills: SkillSoft.com (http://www.skillsoft.com/demos/index.asp)

Programs That Teach Psychomotor Skills

- Learn2.com (http://www.tutorials.com)
- Project Index: Home Depot.com (http://www.homedepot.com)

Programs That Teach Cognitive Skills

- Balance a Checkbook: How to Balance a Checkbook (http://www.ianr.unl.edu/pubs/homemgt/nf4.htm)
- Write a Resume: LearnThat.com (http://www.learnthat.com/courses/business/resume/)

Web/Computer-Based Training Demo Courses

- NETg (http://www.netg.com/DemosAndDownloads/)
- Mindleaders (http://www.mindleaders.com/products/demo.html)
- SkillSoft (http://www.skillsoft.com/demos/index.asp)
- BitLearning (http://www.bitlearning.com/serebra/index.cfm)

Web/EPS Systems

- EPSS Info Site (http://www.epssinfosite.com)
- EPSS World (http://www.epssworld.com)
- Quicken: Retirement Planner (http://www.quicken.com/retirement/planner/)
- Calgary Homes: Floor Planner (http://www.calgaryhomes.com/HTML/interactive/floorplanner.HTML)

\Web/Virtual Asynchronous Classrooms

- Blackboard (http://www.blackboard.com)
- ElementK (http://www.elementK.com/home.asp)
- WebCT (http://www.webct.com)

Web/Virtual Synchronous Classrooms

- Centra (http://www.centra.com)
- IBM Mindspan (http://www.ibm.com/mindspan/)
- Mentergy: ILinc (http://www.mentergy.com)
- WhitePine (http://www.cuseeme.com)

Sample Products

- Banking On Our Future (http://www.bankingonourfuture.org/default.htm)
- Foundations of Prevention (http://www.vnulearning.com/courselist.htm)
- CSAP's Prevention Pathways (http://www.samhsa.gov/preventionpathways/default.cfm)
- Club Drugs 101 (http://209.41.186.181/lexx/pbs/default.asp)

- VNU Learning (http://www.vnulearning.com/courselist.htm)
- Autism Society of America (http://131.103.210.15/ASA/)
- Open UW (http://www.outreach.washington.edu/openuw/)
- 21st CCLC After School Course (http://www.enspire.com/apps/ncce/loader.html)

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Web-Based Training

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